

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of operation within a data processing system, the method comprising:
receiving a first request to execute a first function that is capable of returning data from two or more sources, wherein said two or more sources includes a first data source and a second data source;
in response to receiving said first request, performing the steps of:
~~if the first function is defined to return data in a first type of data structure, the second function, when executed, returning formatting information that indicates an arrangement of fields of data within the first type of data structure~~
determining that said first data source is associated with said first request,
in response to determining that said first data source is associated with said first request, executing a second function to obtain, from said first data source, first organization and data type information describing first data returned from said first source, and
~~executing the first function to obtain a collection of data formatted according to the first type of data structure; and~~
~~organizing the collection of data according to the formatting information returned by the second function.~~
after performing said first function against said first data source, returning first result data, wherein said first result data reflects said first organization and data type information; and
wherein said first result data is in a same format as the first data as stored in the first data source;
receiving a second request to execute said first function,
wherein said second request is different from said first request; and
in response to receiving said second request, performing the steps of:

determining that said first data source is associated with said second request, in response to determining that said second data source is associated with said second request, executing said second function to obtain, from said second data source, second organization and data type information describing second data returned from said second source, and after performing said first function against said second data source, returning second result data, wherein said second result data reflects said second organization and data type information; and wherein said second result data is in a same format as the second data as stored in the second data source.

2-3. (canceled)

4. (currently amended) The method of claim 1 wherein determining that said first data source is associated with first request ~~executing the second function if the first function is defined to return data in a first type of data structure~~ comprises ~~executing the second function if~~ determining whether a predetermined certain keyword is specified as a data return type for the first function.

5. (currently amended) The method of claim 1 wherein determining that said first data source is associated with first request ~~executing the second function if the first function is defined to return data in a first type of data structure~~ comprises ~~executing the second function if~~ determining whether the first function ~~is defined to~~ returns data in an array of data elements.

6-8. (canceled)

9. (currently amended) The method of claim 1 wherein the ~~formatting~~ organization and data type information indicates an arrangement of rows and columns of a database table and wherein organizing the ~~collection of~~ result data according to the ~~formatting~~

organization and data type information comprises tabulating the ~~collection of~~ result data according to the arrangement of rows and columns.

10-15. (canceled)

16. (currently amended) A system comprising:

a processing entity; and

a memory coupled to the processing entity and having program code stored therein

which, when executed by the processing entity, causes the processing entity to: receive a first request to execute a first function included in the program code that is capable of returning data from two or more sources, wherein said two or more sources includes a first data source and a second data source;

in response to receiving said first request, performing the steps of:

determining that said first data source is associated with said first request,

in response to determining that said first data source is associated with said first request, execute a second function to obtain, from said first data source, first organization and data type information describing first data returned from said first source, and

~~included in the program code if the first function is defined to return data in a first type of data structure, the second function, when executed, returning formatting information that indicates an arrangement of fields of data within the first type of data structure~~

~~execute the first function to obtain a collection of data formatted according to the first type of data structure; and~~

~~organize the collection of data according to the formatting information returned by the second function.~~

after performing said first function against said first data source, return first result data, wherein said first result data reflects said first organization and data type information; and wherein said first result data is in a same format as the first data as stored in the first data source;

receive a second request to execute said first function,
wherein said second request is different from said first request; and
in response to receiving said second request, performing the steps of:
determining that said first data source is associated with said second
request,
in response to determining that said second data source is associated with said
second request, execute said second function to obtain, from said second
data source, second organization and data type information describing
second data returned from said second source, and
after performing said first function against said second data source, return
second result data, wherein said second result data reflects said second
organization and data type information; and
wherein said second result data is in a same format as the second
data as stored in the second data source.

17-21. (canceled)

22. (currently amended) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to:
- receive a request to execute a first function included in the one or more sequences of instruction code that is capable of returning data from two or more sources,
wherein said two or more sources includes a first data source and a second data source;
in response to receiving said first request, performing the steps of:
determining that said first data source is associated with said first request,
in response to determining that said first data source is associated with said first request, execute a second function to obtain, from said first data source,
first organization and data type information describing first data returned from said first source, and

~~included in the one or more sequences of instructions if the first function is defined to return data in a first type of data structure, the second function, when executed, returning formatting information that indicates an arrangement of fields of data within the first type of data structure~~

~~execute the first function to obtain a collection of data formatted according to the ——— first type of data structure; and~~

~~organize the collection of data according to the formatting information returned by the second function.~~

after performing said first function against said first data source, return first result data, wherein said first result data reflects said first organization and data type information; and wherein said first result data is in a same format as the first data as stored in the first data source;

receive a second request to execute said first function, wherein said second request is different is different from said first request; and in response to receiving said second request, performing the steps of:

determining that said first data source is associated with said second request,

in response to determining that said second data source is associated with said second request, execute said second function to obtain, from said second data source, second organization and data type information describing second data returned from said second source, and

after performing said first function against said second data source, return second result data, wherein said second result data reflects said second organization and data type information; and wherein said second result data is in a same format as the second data as stored in the second data source.

23. (canceled)

24. (new) The method of claim 1 wherein in response to receiving said first request, further performing:
registering query duration types based upon the data types, wherein said query duration types are temporary data types that reflect data elements and collections of data elements to be fetched from a data source.
25. (new) The method of claim 24 wherein query duration types are used to type-check the first function.
26. (new) The computer readable medium of claim 22 wherein determining that said first data source is associated with first request comprises determining whether a certain keyword is specified as a data return type for the first function.
27. (new) The computer readable medium of claim 22 wherein determining that said first data source is associated with first request comprises determining whether the first function returns data in an array of data elements.
28. (new) The computer readable medium of claim 22 wherein the organization and data type information indicates an arrangement of rows and columns of a database table and wherein organizing the result data according to the organization and data type information comprises tabulating the result data according to the arrangement of rows and columns.
29. (new) The computer readable medium of claim 22 wherein in response to receiving said first request, further performing:
registering query duration types based upon the data types, wherein said query duration types are temporary data types that reflect data elements and collections of data elements to be fetched from a data source.
30. (new) The computer readable medium of claim 29 wherein query duration types are used to type-check the first function.

31. (new) A method of operation within a data processing system, the method comprising:
receiving a request to execute a first function that returns a data structure capable of
storing any data type;
wherein the data structure contains data from a data source ;
executing a second function that generates and returns a list of data types to be returned
by the first function;
wherein the list of data types is received from the data source indicated by the
first function;
registering query duration types based upon the list of data types;
generating output buffers according to the query duration types;
completing query processing using the query duration types;
executing the first function to obtain a collection of data in the data structure;
extracting the collection of data in the data structure;
sending the extracted collection of data in the data structure to the output buffers; and
returning the data in the output buffers according to the query duration types.
32. (new) The method of claim 26 wherein completing query processing further comprises
type-checking the first function using the query duration types.
33. (new) A computer-readable medium carrying one or more sequences of instructions
which, when executed by one or more processors, causes the one or more processors to:
receive a request to execute a first function included in the one or more sequences of
instructions that returns a data structure capable of storing any data type;
wherein the data structure contains data from a data source;
execute a second function included in the one or more sequences of instructions that
generates and returns a list of data types to be returned by the first function;
wherein the list of data types is received from the data source indicated by the
first function;
register query duration types based upon the list of data types;
generate output buffers according to the query duration types;

execute the first function to obtain a collection of data formatted according to the first type of data structure;
extract the collection of data in the data structure;
send the extracted collection of data in the data structure to the output buffers; and
return the data in the output buffers according to the query duration types.

34. (new) The computer readable medium of claim 33 wherein completing query processing further comprises type-checking the first function using the query duration types.